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FROM: U. McMahon, REGULATORY SPECIALIST: _____

DATE: 7/21/87, PHONE: 6-6031

PLEASE REVIEW AND PROVIDE COMMENTS/TSD BY DUE DATE. IF YOU HAVE NO COMMENTS PLEASE CHECK HERE AND RETURN: _____, DATE: _____

DESCRIPTION OF SIP REVISION

DOCKET NO. AND TITLE: R 311 / Statewide SO_2 Rule

STATE: ____ILL, ____IND, ____MICH, ____MINN, ____OHIO, ✓ WISC, ____OTHER

AREA: ✓ STATEWIDE, ____AREA SPECIFIC, ____SITE SPECIFIC, ____OTHER:

TYPE OF SUBMITTAL: ____PART D, ____SITE SPECIFIC, ____MISC.

STATE OF DEVELOPMENT: ____DRAFT, ____FINAL, ____OTHER:

POLLUTANT: ___O_3, ___CO, ___TSP, ✓ SO_2, ___VOC, ___NO_2, ___Pb, ____OTHER:

SUBMITTED BY: TAS - Koerber, COVER LETTER DATE: 7/17/87, DATE RECEIVED: 7/21/87

RC/ACB/ESD DUE DATE: _____

_____ TO PREPARE TSD BY _____ (DATE)

SPECIAL NOTE:

BJ 7-21-87 Wisc

Attached is a proposed TSD recommending approval of these SO_2 rules that has been submitted to USEPA and disapproval for those rules that has not been submitted to USEPA. In addition a public hearing must be held before USEPA can finally approve Wisconsin statewide SO_2 Rules.

TRANSMIT A COPY OF YOUR COMMENTS TO: GARY GULEZIAN
cc: UYLAINE MCMAHAN
AIR AND RADIATION BRANCH
PHONE: 353-0396

SUBMIT ORGINAL TO RAS FILES NO. W1 311 /IF APPROPRIATE SUBMIT TO DOCKET FILE NO. R 311
THIS REQUEST WAS ROUTED FOR INFROMATION PURPOSES ONLY _____

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V

DATE: 17 JUL 1987

SUBJECT: Wisconsin SO_2 SIP -
Technical Support Document

FROM: Mike Koerber MKoerber
Ambient Assessment Unit

TO: Gary Gulezian, Chief
Regulatory Analysis Section

Thru: Carl Nash, Chief C. Nash
Ambient Assessment Unit

Joseph W. Paisie, Chief Joseph W. Paisie
Technical Analysis Section

Attached is a Technical Support Document (TSD) for the Statewide Sulfur Dioxide (SO_2) rule in Wisconsin. For most sources in the State, we recommend approval. As noted in the July 9, 1987, letter to the State, a public hearing must be held for both sources with an emission limit that is less than the categorical limit and sources identified in Attachment #1 (and possibly Attachment #2) to that letter. A complete list of both source groups will be submitted by the State. We recommend that these sources be proposed for approval, but cannot be approved in final until the State has met the public hearing requirement.

Furthermore, no submittal has been received for those sources identified in Attachment #2. We recommend that these sources be proposed for disapproval. If no submittal is received by the time we take final rulemaking action, then Federal promulgation is appropriate.

Attachment

Technical Support Document
Wisconsin Sulfur Dioxide
State Implementation Plan

On April 26, 1984, USEPA notified the Governor of Wisconsin that the Wisconsin SO_2 SIP is inadequate to achieve the primary and secondary NAAQS, pursuant to Section 110(a)(2)(H) of the Clean Air Act, as amended (see Attachment #1). USEPA concluded that the SIP does not contain sufficient source-specific SO_2 emission limitations, schedules, amd timetable for compliance with such limitations, as required by Section 110(a)(2)(B). The finding of SIP inadequacy applied statewide, except for those sources regulated by source-specific New Source Performance Standards (i.e., WPS Weston-Unit 3, WEPCO Pleasant Prairie-Units 1 and 2, WPL Edgewater-Unit 5, WPL Columbia-Unit 2, Dairyland Power-Madgett, Appleton Papers Locks Mill-New Boiler , Flambeau Papers-Boiler 24) and those sources regulated by a USEPA-approved Part D SIP (i.e., Village of Brokaw: Wausau Papers, and City of Madison: Madison Gas & Electric-Blount Street, Oscar Mayer, UW-Madison, Wisconsin State Capitol Heat & Power Plant, Wisconsin Department of Administration-Hillfarms Heating Plant, Mendota Mental Health Institute).

In response to the notice of SIP deficiency, a series of submittals were sent to USEPA. These submittals, summarized in Attachment #2, consisted of a revised SO_2 SIP (emission limitation and State compliance plants) and associated technical support materials.

A master list of sources subject to the notice of SIP deficiency is provided in Attachment #3.

A review of the emission limits and modeling for each source identified in the master list is provided in Attachment #4. The major elements of the SIP are discussed below.

I. Emission Limitations

The revised SIP is comprised of: (1) Statewide Sulfur Dioxide Limitations, NR 417.07 (either the categorical limits identified in subsection (2), more restrictive limits adopted under subsection (4), or alternate limits adopted under subsection (5)), (2) Sulfur Limitations for each nonattainment area (NR 418.025-.08 Brokaw, Madison, Milwaukee, Green Bay and DePere, Peshtigo, Rhinelander, Rothschild), (3) SE Wisconsin AQCR coal-fired limit for small sources, NR 417.04, and (4) numerous new source permits (see Attachment #4).

Each portion of the SIP is reviewed below.

Statewide Sulfur Dioxide Limitations (NR 417.07)

(1) Applicability

Content: This regulation applies to all sources except: (1) those subject to NR 417.04 or 418, or (2) those subject to a limitation more stringent than the limits identified below.

Action: Recommended approval of (1).

(2) Emission Limits for Existing Sources

Content: (a) coal-fired units (at facilities with combined coal-firing capacity $\geq$ 250 MMBTU/hr) = 3.2 #/MMBTU
(b) coal-fired units (at facilities with combined coal-firing capacity < 250 MMBTU/hr) = 5.5 #/MMBTU
(c) residual oil-fired units (at facilities with combined residual oil-firing capacity $\geq$ 250 MMBTU/hr) = 1.5 #/MMBTU
(d) residual oil-fired units (at facilities with combined residual oil-firing capacity < 250 MMBTU/hr) = 3.0 #/MMBTU
(e) Kraft mill (all process sources combined) = 10.0 #/ton ADP
(f) sulfite mill (all process sources combined) = 20.0 #/ton ADP
(g) petroleum refinery:
(1) process heater = 0.8 #/MMBTU firing residual oil
(2) fuel burning equipment firing residual oil = 0.8 #/MMBTU
(3) Claus sulfur recovery plant = 6743 #/24-hour and 843 #/3-hour
(4) all other process units = 1035 #/1-hour

Action: Recommend approval, subject to the source-specific demonstrations of attainment. No action on (g) is recommended since no attainment demonstration was provided with these limits for any source. If in the future the State discovers that any of these limits will not protect the NAAQS or PSD increments for a given source, then the State must develop more stringent limits (pursuant to subsection (4)). USEPA would expect the State to submit these new limits to USEPA as site-specific SIP revisions.

(3) Emission Limit for New Sources
Content: (see text of the rule)
Action: No action is recommended since no attainment demonstration was provided with these limits for any source. Furthermore, new source review regulations require a case-by-case determination of the appropriate emission limitation.

(4) More Restrictive Emission Limits
Content: Gives the State the authority to revise State rules to require more stringent emission limits if necessary to ensure no violations of the SO_2 NAAQS or PSD increment.

Action: Recommend approval. State must have authority to revise its own rules if necessary to protect the public health or welfare. Of course, all more stringent State limits necessary to protect the NAAQS and PSD increments must still be submitted to USEPA as site-specific SIP revisions.

(5) Alternate Emission Limits
Content: Establishes State procedures for sources to obtain relaxed State emission limitations.

Action: Recommend approval of procedures. Of course, all relaxed State limits must still be submitted to USEPA as site-specific SIP revisions.

(6) Compliance Schedules

Content: Establishes schedule for achieving final compliance and the date for final compliance.

Action: Recommend approval. Schedules and final dates are consistent with USEPA's Post-1982 Attainment Policy (see "Guidance Document for Correction of Part D SIPs for Nonattainment Areas").

(7) Compliance Demonstrations

Content: Requires each source to submit a plan for demonstrating compliance based on one or more of the following methods - stack tests, fuel sampling and analysis, continuous emission monitoring, or other methods approved by the State.

Action: Recommend approval. Of course, the individual compliance plans must still be submitted to USEPA as site-specific SIP revisions, if the State wants these plans to be federally enforceable.

(8) Variance from Emission Limits

Content: Establishes alternative State procedures for sources to obtain relaxed State emission limitations.

Action: Recommend approval of procedures. Of course, the relaxed State limits must still be submitted to USEPA as site-specific SIP revisions.

(9) Subsequent Requests for Alternate Limits or Variances

Content: Defines procedures to be followed for specific time periods.

Action: Recommend approval. Of course, the revised State limits must still be submitted to USEPA as site-specific SIP revisions.

(Note, Attachment #5 identifies the State's negative declarations with respect to NR 147.07. These findings impose fuel type restrictions (cannot burn residual oil or coal) or verify the shutdown status of many sources. Thus, the negative declarations need to be incorporated in the SIP.)

Sulfur Limitations for Nonattainment Areas

(Covered in separate technical support documents for each area. Not discussed here.)

SE Wisconsin Coal Limit (NR 417.04)

Content: coal-fired units (at facilities with combined coal-firing capacity < 250 MMBTU/hr) = 2.22 #/MMBTU (Racine County - Frank Pure, Kenosha County-Am Motors Lakeside, Milwaukee County - Milwaukee House of Correction, Cudahy Tanning, Continental Can, Falk (B20)).

Action: Recommend approval, subject to the source-specific demonstrations of attainment.

Operating Permit Limitations

The following sources are covered by operating permits which impose emission limitations that are more stringent than those identified in NR 147.07

District	County	Source
WCD	Clark	Greenwood Milk (B20,21)
		Lynn Proteins (B21)
	Dunn	Allied Processors (B21)
NCD	Portage	Neenah Paper-Whiting (B-01)
	Wood	CPI-Kraft
NWD	Douglas	Koppers (B22)
	Price	Flambeau Papers (Pulp Mill)
SED	Sheboygan	Borden
	Racine	J.I. Case
	Milwaukee	Peter Cooper

Action: Recommend approval, subject to the source-specific demonstrations of attainment.

(Note, in addition the following sources are subject to the Federal New Source Performance Standards: Dairyland Power-Madgett, WPL-Columbia (Unit 2), Appleton Papers-Locks Mill (New Boiler), WEPCo-Pleasant Prairie (Units 1 and 2), Flambeau Papers (B24), WPL-Edgewater (Unit 5), WPS-Weston (Unit 3).)

II. Compliance Test Methods

The identification of the Wisconsin State Implementation Plan (SIP) is contained in 40 CFR 52.2570. The SIP incorporates by reference Section NR 154.06 of the Wisconsin Administrative Code. This section requires:

(1) reporting of "information to locate and classify air contaminant sources according to the type, level, duration, frequency and other characteristics of emissions and such other information as may be necessary. The information shall be sufficient to evaluate the effect on air quality and compliance with these rules."

(2) stack or performance tests following the methods required or approved by USEPA.

(3) recordkeeping and reporting of all testing and monitoring, and any other information relating to the emission of air contaminants.

On May 28, 1987, Wisconsin DNR notified USEPA that the stack test methodology existing in the Wisconsin SIP remains an independent means of demonstrating compliance. Although Wisconsin DNR has also developed a site-specific compliance plans for all sources subject to NR 417.07, the State has made it clear to USEPA and to each company that regardless of a source's compliance status as determined by the source's site-specific compliance methodology, a stack test

can still be used to determine whether a violation of the applicable emission limitation is occurring. USEPA accepts the use of a stack test as the compliance test method for most sources. (Note, the State's site-specific compliance plan will not be included in the SIP, at the request of the State.)

For several sources, however, the State's control strategy is based on certain conditions in addition to the "lbs/MMBTU" emission limitation. These conditions consist of stack height increases/stack mergings, restrictions on operating load, boiler operation, limits as a function of operating load, etc. For most of these conditions, specific recordkeeping and reporting requirements are necessary to assess compliance. A list of these sources is included in a July 9, 1987, letter from Steve Rothblatt, USEPA, to Donald Theiler, WDNR (see Attachment #6). WDNR must ensure that these conditions and recordkeeping/reporting requirements are properly adopted at the State level prior to inclusion in the SIP. These sources cannot be approved until this happens.

III. Attainment Demonstration - The State performed dispersion modeling to verify the adequacy of the categorical emission limits (NR 417.07(2)) or to establish more stringent limits. A modeling protocol for this analysis was established (see Attachment #7). To support alternate emission limits (i.e., higher than categorical), each company was required to perform a modeled attainment demonstration. These demonstrations generally followed the State-USEPA protocol and USEPA modeling guidelines.

The modeling techniques used in the demonstrations supporting these regulations are based on the modeling guidelines in place at the time that the analyses were performed (i.e., "Guideline on Air Quality Models", April 1978 and "Regional Workshops on Air Quality Modeling: A Summary Report", April 1981). Since that time, revisions to the modeling guidelines have been promulgated (51 FR 32176, September 9, 1986). On June 3, 1986, the State asked that the modeling performed in support of the statewide SO_2 rule be grandfathered from any different requirements imposed by the revised guidelines. On December 29, 1986, USEPA approved the State's grandfathering request since the modeling was generally completed and regulatory action is underway.

A. Modeling for Categorical and More Stringent Limits

Model - For screening analyses, PTPLU or VALLEY was used and for refined analyses, ISCST was used. (Note, in Milwaukee, ISCST-urban was used).

MET Data - Depending on the modeling approach and the modeling results, the meteorological data base consisted on: (a) wind speed/stability class combinations in PTPLU, (b) one year of NWS data (1977), or (c) five years of NWS data. One year of NWS data was accepted in only a few cases where it was clear that the NAAQS would not be threatened (i.e., max. short-term impacts are less than 10-50% of the NAAQS).

Emission Inventory - All sources were modeled at maximum allowable emission levels. Large sources were subject to an initial screening analysis of multiple loads to determine the worst-case operating load. Any source considered significant enough to be modeled with ISCST, was modeled for building downwash, if the stack height was less than the GEP formula height.

In several counties with multiple sources, each source was modeled individually. This is acceptable since: (1) the sources are spatially separated by 5-30 km, (2) the maximum impact due to each source usually occurred within 1-2 km of each source, (3) the conservative background concentration was felt to account adequately for the impact of the other sources in the County.

The analysis for three multi-source areas (Milwaukee, Appleton, Neenah-Menasha) was performed in several steps. First, all sources were screened with PTPLU (or ISCST-urban with PT-MET conditions) to identify the major sources (i.e., max impact > NAAQS-background). Second, all major sources were modeled together with one year of meteorological data and the coarse receptor grid (250 m resolution around each source and 500 m resolution elsewhere). Third, the remaining four years of meteorological data were run for each major source with maximum impact > NAAQS-background (based on one year of meteorological data) and the coarse grid (or a subset of coarse grid receptors). Fourth, the two highest second high 3-hour and 24-hour concentrations for each major source were identified based on the five-year results. These events were then remodeled with a fine receptor grid (100 m resolution) centered on the critical coarse grid receptors and the major sources. Finally, the two highest second high 3-hour and 24-hour periods and receptors from the fine grid analysis were remodeled with all sources. A list of source culpabilities were generated to facilitate control strategy development.

This approach assumes that the major sources should dominate the selection of critical events and the location/magnitude of high concentrations. USEPA accepts this assumption. It should be noted that the minor sources' maximum impact and contribution to high total areawide concentrations were included in the attainment demonstration. Thus, the State's modeling analysis in these three multi-source area is acceptable.

PSD Increment Analysis - According to the PSD regulations, emission changes reflected by new SIP limitations occurring after the baseline date consume increment. In Wisconsin, the SO_2 baseline date has been set in Manitowoc (1979), Outagamie (1983), Calumet (1983), Brown (1983), Winnebago (1983), and Wood (1985) Counties. The State reviewed their emission inventory for these counties to identify cases where the 1985 actual "lbs/MMBTU" emission level exceeds the baseline "lbs/MMBTU" emission level. (Note, use of actual emissions rather than allowable emissions is acceptable in calculating increment consumption if the source has not actually increased its emissions. Since the State regulations were adopted at the State level in 1984, use of 1985 data represents a reasonable measure of post-baseline emissions.) A significant increase was expected for only five sources. For these sources, the State performed a dispersion modeling analysis using ISCST-rural, 1973-1977 meteorology, and 500 m coarse/100 m fine receptor grids to assess increment consumption. The modeled inventory included the existing source emissions increase (i.e., difference between 1985 and baseline emissions), as well as any nearby PSD source. The analysis showed that the increments would be protected (see Attachment #8).

Interstate Impact Analysis - The Clean Air Act requires that the Wisconsin SIP not allow emissions which will prevent attainment or maintenance of the NAAQS in any other State. The available USEPA models, however, only allow impacts from a given source (or group of sources) to be calculated out to 50 km of another state are located in 27 counties - the 26 counties on the northern, western, and southern edge of the State, plus Racine County. For the 26 border counties, the State's analysis either: (1) demonstrated attainment at receptors located in the other state, or (2) implied attainment in the other state (e.g., modeled attainment in Wisconsin, decreasing concentration gradient in the direction of the other state, and no other sources between those modeled in Wisconsin and the other state). (Note, Racine County sources are indirectly included in the Kenosha County analysis via the monitored background concentration. So the Kenosha County interstate impact analysis also serves as the Racine County analysis.)

Consistency with GEP Regulations - As noted in Attachment #4, the control strategy for several sources involves stack height increases or stack mergings. In addition, there are some sources with stacks constructed or merged since 1970. A summary of these case are provided below.

Stack Height Increase/Merging - National Presto, Chippewa County (raise 2 stacks to 55')
Bush Bros, Eau Claire County (raise 2 stacks to 75')
Beatrice Cheese, Wood County (raise 1 stack to 83')
Niagara of Wisconsin, Marinette County (raise 1 stack to 191.3')
Midtec Papers, Outagamie County (raise 1 stack to 120')
Gilbert Papers, Winnebago County (raise 1 stack to 200')
Kimberly Clark-Neenah, Winnebago County (raise 2 stacks to 60')
Thilmany Paper, Outagamie County (raise 1 stack to 290')
Waste Research & Reclamation, Eau Claire County (combine 2 stacks to 1-60' stack)
Mosinee Papers, Marathon County (combine 2 stacks to 1-213' stack)
Kimberly Clark-Lakeview, Winnebago County (combine 2 stacks to 1-46' stack)
WP&L Edgewater, Sheboygan County (combined 1-250', 1-360' stacks to 1-550' stack in 1978)
Dairyland Power Alma, Buffalo County (combined 3 stacks to 1-700' stack in 1974)
Consolidated Papers-Kraft (vent recovery boiler No. 1 exhaust from 90.8m stack to new 91.2m stack)
Consolidated Papers-Biron (2-160' stacks raised to 230' in 1976)

Above 213'

New Stack (New Unit)^- WP&L Columbia (Unit 2), Columbia County*
Dairyland Power Madgett, Buffalo County*
Consolidated Papers-Biron (B005), Wood County**
WEPCO Pleasant Prairie, Kenosha County**
WPS Weston (Unit 3), Marathon County**
Consolidated Papers-Kraft (No. 3 Recovery Boiler), Wood County**

* Modeled at GEP height
** Modeled at actual height ($\leq$ GEP height)

All of the stack height increases (new taller stack for existing unit(s)), except Thilmany Papers and Dairyland Power Alma, are fully creditable (i.e., new stack is less than or equal to de minimis height (213 feet), stack height increase up to formula height occurred before October 11, 1983), or stack height credit limited to grandfathered height. The stack height increase at Thilmany Papers occurred after October 11, 1983. According to the Stack Height Regulations, credit for a stack height increase up to formula height after this date must be supported by evidence that additional stack height is necessary to avoid downwash-related concentrations raising health and welfare concerns. The Company performed a fluid modeling analysis to demonstrate excessive concentrations at the existing stack height. Thus, credit for the GEP formula height is allowable for the new stack.

(Note, the stack extensions at Consolidated Papers-Biron are due to the installation of nozzles on each stack. The State demostrated that the nozzles did not significantly increase the final plume rise. Thus, the nozzles are not a dispersion enhancement technique.)

No submittal has been received to date for Dairyland Power Alma.

All of the stack merging, except CPI-Kraft (Nos. 1, 3 Recovery Boilers) and WP&L Edgewater, are creditable for the following reasons: total plantwide allowable emissions less than 5000 T/yr (Waste Research & Rec, Mosinee Papers, Kimberly Clark-Lakeview), installation of pollution control equipment/no increase in emissions for pre-1985 merging (Dairyland Power Alma). WDNR modeled WP&L Edgewater and CPI-Kraft assuming no credit for merged stacks.

All of the new (post-1970) stacks for new units were either modeled at the GEP formula height (if the actual height > GEP height) or modeled at the actual height (if the actual height $\leq$ GEP height).

Finally, as part of WNDR's stack height review, numerous other sources have already been determined to be exempt from the stack Height Regulations (i.e., mergings at plants with total allowable emissions less than 5000 T/yr and stack height increases or new stacks less than 213 feet). (Note, there are stack height issues associated with some sources covered by NR 418, which will be addressed in the technical support documents for each area.)

B. Modeling for Alternate Limits - To date, the only alternate limit (higher than categorical) submitted by WDNR has been for Consolidated Papers-Biron. A summary of this modeling is provided below.

(1) Consolidated Papers - Biron

MODEL - ISCST

MET DATA - 1973-1977 Madison/Green Bay

EMISSION INVENTORY - CPI-Biron, Ore-Ida, Nekoosa Papers-Nekoosa, Nekoosa-Port Edwards, CPI-Kraft were modeled at maximum allowable conditions. A screening analysis was performed to demonstrate that 100% load was the worst-case load for CPI-Biron.

RECEPTORS - 360 coarse grid receptors (within 3 km of CPI) and fine grid receptor network (100m resolution). Receptors were located outside CPI fenceline. No terrain elevations were assumed.

BACKGROUND - 29 ug/m^3 (24-hour), 98 ug/m^3 (3-hour) based on nearby monitoring data

NAAQS ANALYSIS - The constraining impact was 343 ug/m^3 (24-hour), including background. All other standards were also attained.

PSD ANALYSIS - Less than half of the short-term PSD increments were consumed (39 ug/m^3 (24-hour) and 217 ug/m^3 (3-hour)). Negligible annual impacts were predicted.